

NASA TECH BRIEF

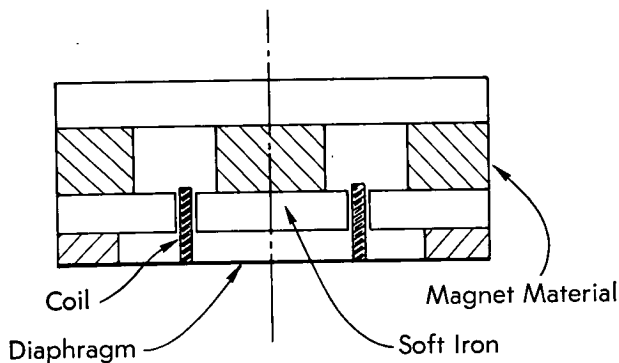
Ames Research Center



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Electrodynamic Actuators for Rocket Engine Valves

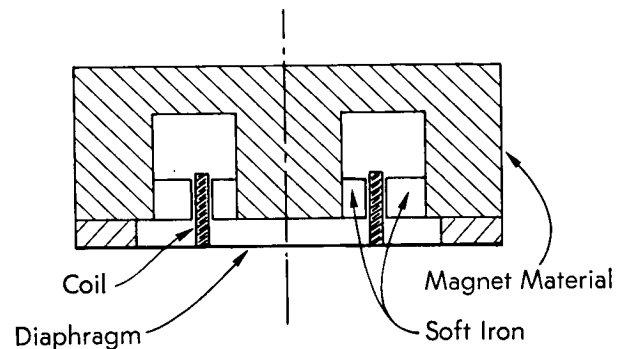
The electrodynamic actuators which are frequently used in acoustic loudspeakers can also be used to operate liquid rocket engine valves if the light paper cones of the acoustic loudspeakers are replaced with flexible metal diaphragms. Typical configurations of actuators with diaphragms are illustrated in the diagrams.



Electrodynamic actuators are of particular interest because their coils and magnets are isolated from propellants by diaphragms, provided pressure is equalized on both sides of the diaphragms. However, if a coil can be submerged in propellant, heat transfer from the coil will be enhanced and more power can then be applied to obtain greater motive force.

The results of an analysis which compares electrodynamic actuators with solenoid actuators indicate that electrodynamic actuators provide better time response. Moreover, since sliding friction is elimi-

nated, the service life and reliability of electrodynamic valves is greater than for corresponding sizes of valves actuated by other means.



Note:

Requests for further information may be directed to:

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No patent action is contemplated by NASA.

Source: O. Fiet and D. Doshi of
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